



Tactical Combat Casualty Care

August 2011



Tactical Evacuation Care



OBJECTIVES

- **DESCRIBE** the differences between MEDEVAC and CASEVAC
- **DESCRIBE** the four evacuation categories
- **DESCRIBE** the differences between Tactical Field Care and Tactical Evacuation Care
- **LIST** the nine items in a MEDEVAC request



OBJECTIVES

- **DESCRIBE** the additional assets that may be available for airway management, electronic monitoring, and fluid resuscitation
- **LIST** the indications and administrative controls applicable to giving Packed Red Blood Cells (PRBCs) in the field



OBJECTIVES

- **STATE** the rules of thumb for calling for Tactical Evacuation and the importance of careful calculation of the risk/benefit ratio prior to initiating the call



Tactical Evacuation

- Casualties will need to be evacuated as soon as feasible after significant injuries.
- Evacuation asset may be a ground vehicle, aircraft, or boat.
- **Evacuation time is highly variable - significant delays may be encountered.**
- Tactical situation and hostile threat to evacuation platforms may differ markedly from one casualty scenario to another.
- The Tactical Evacuation phase allows for additional medical personnel and equipment to be used.



Evacuation Terminology

- **MEDEVAC:** evacuation using special dedicated medical assets marked with a Red Cross
 - MEDEVAC platforms are non-combatant assets
- **CASEVAC:** evacuation using non-medical platforms
 - May carry a Quick-Reaction force and provide close air support as well
- **Tactical Evacuation (TACEVAC)** - this term encompasses both types of evacuation above



Aircraft Evacuation Planning

- Flying rules vary widely among different aircraft and units
- Consider:
 - Distances and altitudes involved
 - Day versus night
 - Passenger capacity
 - Hostile threat
 - Medical equipment
 - Medical personnel
 - Icing conditions





Aircraft Evacuation Planning

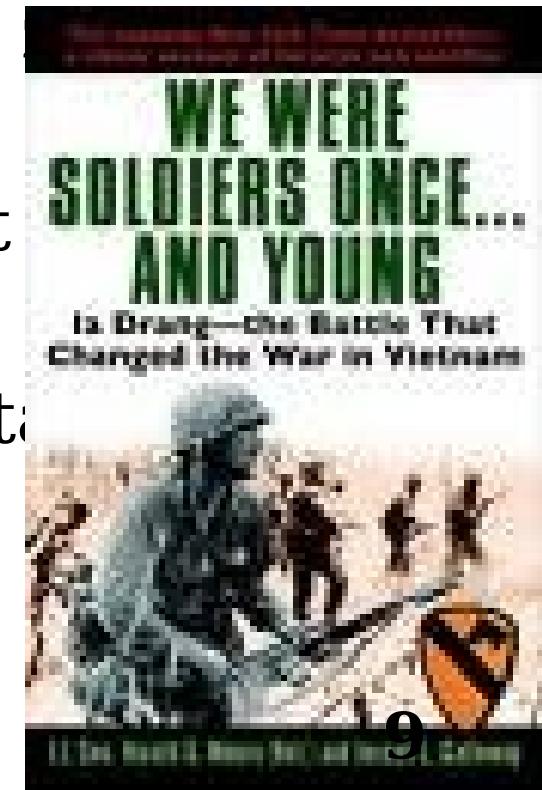
- Ensure that your evacuation plan includes aircraft capable to fly the missions you need
- Primary, secondary, tertiary options





CASEVAC vs. MEDEVAC: The Battle of the Ia Drang Valley

- 1st Bn, 7th Cavalry in Vietnam
- Surrounded by 2000 NVA - heavy casualties
- Called for MEDEVAC
- Request refused because landing was not secure
- Eventual pickup by 229th Assault Helo Squadron after long delay
- Soldiers died because of this mistake
- Must get this part right





Ground Vehicle Evacuation

- More prevalent in urban-centric operations in close proximity to a medical facility
- May also be organic to unit or designated MEDEVAC





Tactical Evacuation Care

- TCCC guidelines for care are largely the same in TACEVAC as for Tactical Field Care.
- There are some changes that reflect the additional medical equipment and personnel that may be present in the TEC setting.
- This section will focus on those differences





Airway in TACEVAC

- Additional Options for Airway Management
 - Laryngeal Mask Airway
 - CombiTube
 - Endotracheal Intubation (ETT)
- Confirm ETT placement with CO2 monitoring
- These airways are advanced skills not taught in basic TCCC course





Breathing in TACEVAC

- Watch for tension pneumothorax as casualties with a chest wound ascend to the lower pressure at altitude.
- Pulse ox readings will become lower as casualty ascends unless supplemental oxygen is added.
- Chest tube placement may be considered if a casualty with suspected tension pneumo fails to respond to needle decompression



Supplemental Oxygen in Tactical Evacuation Care

Most casualties do not need supplemental oxygen, but have oxygen available and use for:

- Casualties in shock
- Low oxygen sat on pulse c
- Unconscious casualties
- Casualties with TBI
 - (maintain oxygen saturation > 90%)
- Chest wound casualties





Tranexamic Acid (TXA)

5. Tranexamic Acid (TXA)

If a casualty is anticipated to need significant blood transfusion (for example: presents with hemorrhagic shock, one or more major amputations, penetrating torso trauma, or evidence of severe bleeding)

- Administer 1 gram of tranexamic acid (TXA) in 100 cc Normal Saline or Lactated Ringer's as soon as possible but NOT later than 3 hours after injury.
- Begin second infusion of 1 gm TXA after Hextend or other fluid treatment.

* Note: Per the Assistant Secretary of Defense for Health Affairs memo dated 4 November 2011, use of TXA outside of fixed medical facilities is limited to the Special Operations community.



TXA

Administration - 2nd Dose

- **Typically given after the casualty arrives at a Role II/Role III medical facility.**
- **May be given in Tactical Evacuation Care if the first dose was given earlier, and fluid resuscitation has been completed before arrival at the medical facility.**
 - **Should NOT be given with Hextend or through an IV line with Hextend in it**
 - **Inject 1 gram of TXA into a 100-cc bag of normal saline or lactated ringer's**
 - **Infuse slowly over 10 minutes**



Fluid Resuscitation in TACEVAC

6. Fluid Resuscitation

Reassess for hemorrhagic shock (altered mental status in the absence of brain injury and/or change in pulse character). **If BP monitoring is available, maintain target systolic BP 80-90 mmHg.**

a. If not in shock:

- No IV fluids necessary.
- PO fluids permissible if conscious and can swallow.

b. If in shock and blood products are not available:

- Hextend 500-mL IV bolus
- Repeat after 30 minutes if still in shock.
- Continue resuscitation with Hextend or crystalloid solution as needed to maintain target BP or clinical improvement.



Fluid Resuscitation in TACEVAC

6. Fluid Resuscitation
 - c. If in shock and blood products are available under an approved command or theater protocol:
 - Resuscitate with 2 units of plasma followed by packed red blood cells (PRBCs) in a 1:1 ratio. If blood component therapy is not available, transfuse fresh whole blood. Continue resuscitation as needed to maintain target BP or clinical improvement.
 - d. If a casualty with an altered mental status due to suspected TBI has a weak or absent peripheral pulse, resuscitate as necessary to maintain a palpable radial pulse. If BP monitoring is available, maintain target systolic BP of at least 90 mmHg.



Blood Product Administration

- 1) The success of blood product administration in improving the survival of trauma patients is unquestioned, and blood products are the standard for **hospital-based** trauma care in both military and civilian settings.



Blood Product Administration

- 2) The additional benefit gained from starting blood products in the **prehospital** phase has not yet been established in the medical literature, but the Defense Health Board has agreed that this therapy may be beneficial in the prehospital setting if blood products are available.



Blood Product Administration

- 3) Blood product administration should be initiated if feasible for any casualty who meets protocol criteria ***and is still enroute to the medical treatment facility***. There is no minimum transport time below which blood product therapy should not be initiated if protocol criteria are met. Casualties who have absent radial pulse and/or decreased mental status due to hemorrhagic shock in the prehospital setting have a very high mortality rate and are in need of blood products as soon as possible.



Blood Transfusion Protocols

- Transfusion of blood products **should not be attempted in the absence of a theater- or command-approved protocol.**
- Blood products should be transfused **only by providers that have been appropriately trained** in the governing protocol.



Damage Control Resuscitation

- Standard of care for severe shock is now “1:1” therapy
 - One unit of plasma for every unit of packed red cells
 - Different from previous focus primarily on packed red cells
 - Plasma helps to control hemorrhage by promoting clotting
 - Has been shown to increase survival



Protocols for FDA-Compliant Blood Products (Component Therapy)

- Issues to address include:
 - Minimum provider level required
 - Training in blood product administration
 - Preparation and transport of blood products
 - Transfusion equipment
 - Which casualties need blood products
 - Verifying correct blood type



Protocols for FDA-Compliant Blood Products (Component Therapy)

- Issues to address include (cont):
 - Which products should be given and how much
 - Transfusion procedures
 - Management of transfusion reactions
 - Documentation of blood product administration



Non - FDA Compliant Blood Products (Fresh Whole Blood (FWB))

- Must be administered IAW Assistant Secretary of Defense for Health Affairs memo of 19 March 2010
- Used only in emergencies when:
 - No FDA-compliant blood products are available
 - Complying with a command-approved protocol
 - Providers trained in the protocol
- Transfusing FWB may save lives when blood components are not available



Protocols for Non-FDA Compliant Blood Products

- Issues to address include:
 - Minimum provider level required
 - Training in FWB administration
 - Transfusion equipment
 - Which casualties need FWB
 - Prescreened donor pool
 - Screening for infectious agents
 - Verifying blood type
 - Transfusion procedures



Protocols for Non-FDA Compliant Blood Products

- Issues to address include (cont):
 - How much FWB should be given
 - Management of transfusion reactions
 - Documentation of blood product administration
 - Post-transfusion monitoring of donor and recipient



Hypothermia Prevention in TACEVAC

Remember to keep the casualty on an insulated surface or get him/her on one as soon as possible.

Apply the Ready-Heat Blanket from the Hypothermia Prevention and Management Kit (HPMK), to the casualty's torso (directly on the skin) and cover the casualty with the Heat-Reflective Shell (HRS).





Hypothermia Prevention in TACEVAC

If a HRS is not available, the previously recommended combination of the Blizzard Survival Blanket and the Ready Heat blanket may also be used.



Use a portable fluid warmer capable of warming all IV fluids including blood products.



Remember Prevention of Hypothermia in Helicopters!



- Cabin wind and altitude cold result in
- **Protection especially important for ca
in shock and burn casualties**



CPR in Tactical Evacuation Care

17. CPR in TACEVAC Care

a. Casualties with torso trauma or polytrauma who have no pulse or respirations during TACEVAC should have bilateral needle decompression performed to ensure they do not have a tension pneumothorax. The procedure is the same as described in section 2 above.



CPR in Tactical Evacuation Care

17. CPR in TACEVAC Care

b. CPR may be attempted during this phase of care if the casualty does not have obviously fatal wounds and will be arriving at a facility with a surgical capability within a short period of time. CPR should not be done at the expense of compromising the mission or denying lifesaving care to other casualties.



TACEVAC CARE - Hoisting



- **Rigid Litters Only** When Hoisting
- Check and double-check rigging

A silhouette of a tractor with a plow attached, working in a field at sunset. The sky is a warm orange and yellow.

Questions?



Standard Evacuation Categories

- **Urgent/Urgent Surgical:** 2 hour window to save life, limb, or eyesight
- **Priority:** Can be safely managed for 4 hours
- **Routine:** Can be safely managed for 24 hours
- **Convenience:** Can be safely managed at location and do not hinder ongoing tactical mission

Tactical Evacuation: Nine Rules of Thumb





TACEVAC 9 Rules of Thumb: Assumptions

- These Rules of Thumb are designed to help the corpsman or medic determine the true urgency for evacuation.
- They assume that the decision is being made at 15-30 minutes after wounding.
- Also that care is being rendered per the TCCC guidelines.
- Most important when there are tactical constraints on evacuation:
 - Interferes with mission
 - High risk for team
 - High risk for TACEVAC platform



TACEVAC Rule of Thumb

#1

Soft tissue injuries are common and may look bad, but usually don't kill unless associated with shock.





TACEVAC Rule of Thumb #2

Bleeding from most extremity wounds should be controllable with a tourniquet or hemostatic dressing. Evacuation delays should not increase mortality if bleeding is controlled.





TACEVAC Rule of Thumb

#3

**Casualties who are in shock
should be evacuated as soon
as possible.**



Gunshot wound to the abdomen



TACEVAC Rule of Thumb

#4

Casualties with penetrating wounds of the chest who have respiratory distress unrelieved by needle decompression should be evaluated as possible.





TACEVAC Rule of Thumb

#5

Casualties with blunt or penetrating trauma of the face associated with airway difficulty should have an immediate airway established and be evacuated as soon as possible.

REMEMBER to let the casualty sit up and lean forward if that helps or her to breathe better!





TACEVAC Rule of Thumb

#6

Casualties with blunt or penetrating wounds of the head where there is obvious massive brain damage and unconsciousness are unlikely to survive with or without emergent evacuation.



TACEVAC Rule of Thumb

#7

Casualties with blunt or penetrating wounds to the head - where the skull has been penetrated but the casualty is conscious - should be evacuated emergently.





TACEVAC Rule of Thumb

#8

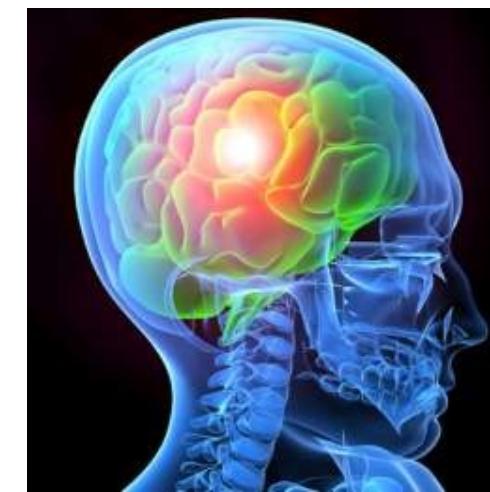
Casualties with penetrating wounds of the chest or abdomen who are not in shock at their 15-minute evaluation have a moderate risk of developing late shock from slowly bleeding internal injuries. They should be carefully monitored and evacuated as feasible.





TACEVAC Rule of Thumb #9

Casualties with TBI who display “red flag” signs - witnessed loss of consciousness, altered mental status, unequal pupils, seizures, repeated vomiting, visual disturbance, worsening headache, unilateral weakness, disorientation, or abnormal speech - require urgent evacuation to a medical treatment facility.



Questions?





9-Line Evacuation Request



Required if you want an evacuation from an



9-Line Evacuation Request

- Request for resources through tactical aircraft channels.
- NOT a direct medical communication with medical providers
- Significance
 - Determines tactical resource allocation
 - DOES NOT convey much useful medical information



9-Line Evacuation Request

Line 1: Pickup location

Line 2: Radio frequency, call sign and suffix

Line 3: Number of casualties by precedence (evacuation category)

Line 4: Special equipment required



9-Line Evacuation Request

Line 5: Number of casualties by type (litter, ambulatory)

Line 6: Security at pickup site

Line 7: Method of marking pickup site

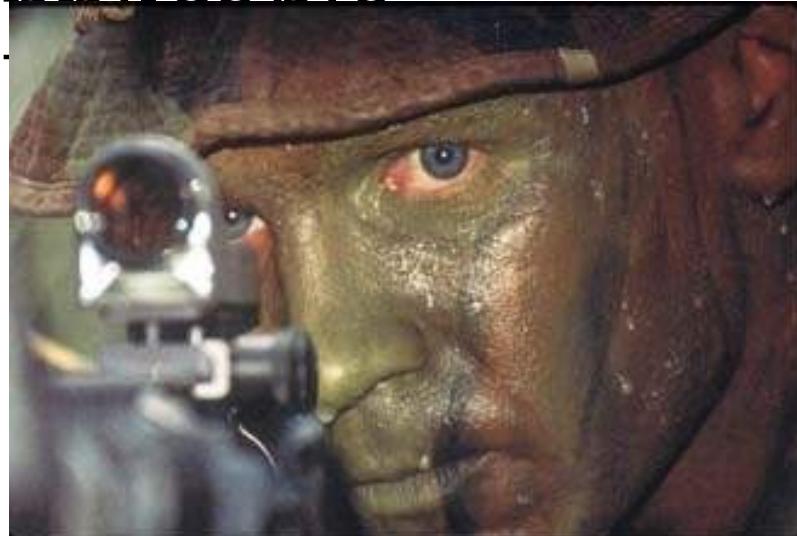


9-Line Evacuation Request

Line 8: Casualty's nationality and status

Line 9: Terrain Description; NBC contamination

if applicable





TACEVAC Care for Wounded Hostile Combatants

- Principles of care are the same for all wounded combatants
- Rules of Engagement may dictate evacuation process
- Restrain and provide security
- Remember that each hostile casualty represents a potential threat to the provider and the unit and take appropriate measures
- **They still want to kill you.**





Tactical Evacuation Care Summary of Key Points

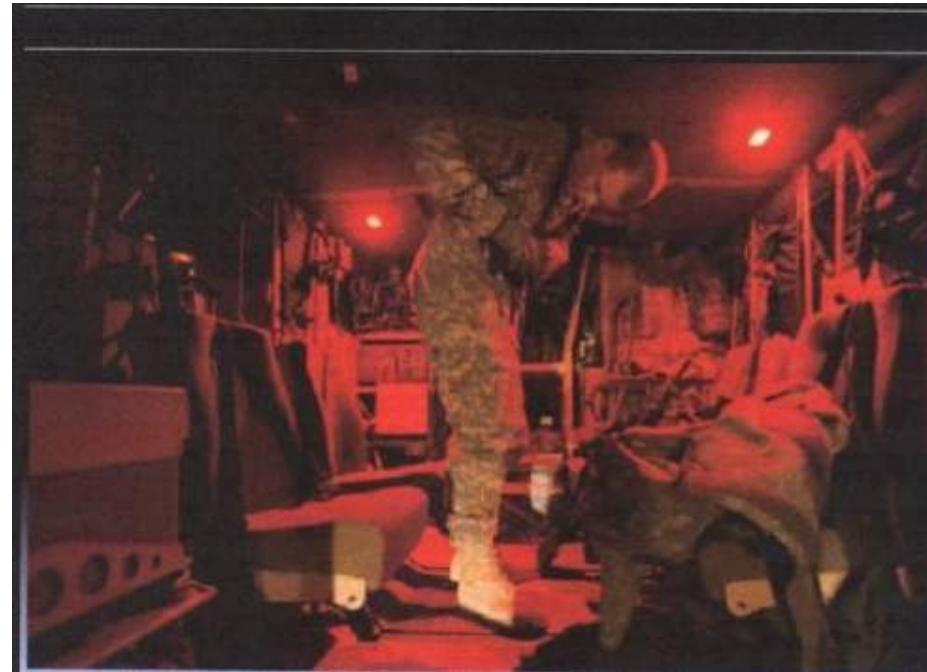
- Evacuation time is highly variable
- Thorough planning is key
- Similar to Tactical Field Care guidelines but some modifications





Tactical Evacuation Care Summary of Key Points

- Tactical Evacuation Rules of Thumb
- Evacuation Categories
- 9-Line Evacuation Request





Convoy IED Scenario

Recap from TFC

Your last medical decisions during TFC enroute to HLZ:

- Placed tourniquet on both bleeding stumps
- Disarmed
- Placed NPA
- Established IV
- Administered 1 gm TXA and 500 ml Hextend®
- IV antibiotics
- Provided hypothermia prevention
- Your convoy has now arrived at the HLZ



Convoy IED Scenario

What is your 9-line?

Line 1: Grid NS 12345678

Line 2: 38.90, Convoy 6

Line 3: 1 Urgent

Line 4: PRBCs, oxygen, advanced airway

Line 5: 1 litter

Line 6: Secure

Line 7: VS-17 (Orange Panel)

Line 8: U.S. Military

Line 9: Flat field

* Some individuals recommend adding a tenth line: the casualty's vital signs⁵⁸



Convoy IED Scenario

Next steps?

- Continue to reassess casualty and prep for helo transfer
 - Search casualty for any remaining weapons before boarding helo
 - Secure casualty's personal effects
 - Document casualty status and treatment
- Helicopter arrives. Casualty is transferred to helo
- Medic stays with convoy



Convoy IED Scenario

What's Next?

- Casualty is now conscious but is confused
- Reassess casualty for ABCs
 - NPA still in place
 - Tourniquets in place, no significant bleeding
- Attach electronic monitoring to casualty
 - Heart rate 140; systolic BP 70
 - O2 sat = 90%



Convoy IED Scenario

What's next?

- Supplemental Oxygen
 - Why?
 - Casualty is still in shock

What's next?

- Administer Plasma:PRBCs in 1:1 ratio if available
- If blood products not available, 2nd bolus of Hextend® 500ml
 - Why?
 - Casualty is still in shock



Convoy IED Scenario

What's next?

- Inspect and dress known wounds and search for additional wounds

What's next?

- Try to Remove tourniquets and use hemostatics?
 - No
 - Why? THREE reasons:
 - Short transport time - less than 2 hours from application of tourniquets
 - No distal extremities to lose
 - Casualty is in shock



Questions/Commer